AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (currently amended): A butadiene-based polymer having a 1,3-butadiene monomer unit, characterized in that a cis-1,4 bond content and a vinyl bond content in the 1,3-butadiene monomer unit as measured by a Fourier transform infrared spectroscopy (FT-IR) and calculated according to the following equations (IV) and (VI) are~~is~~ not less than 98.0% and not more than 0.3%, respectively, and a ratio (Mw/Mn) of weight average molecular weight (Mw) to number average molecular weight (Mn) is 1.6-3.5,

(cis-1,4 bond content) = e/(e+f+g)x100 (%) ····· (IV)

(vinyl bond content) = g/(e+f+g)x100 (%) ····· (VI)

wherein e, f and g are derived from the following matrix (III):

$$\begin{bmatrix} 1.7455 & 0 & -0.0151 \\ -0.0454 & 0.4292 & -0.0129 \\ -0.007 & 0 & 0.3746 \end{bmatrix} \begin{bmatrix} \log_{10}(a/d) \\ \log_{10}(a/b) \\ \log_{10}(a/c) \end{bmatrix} = \begin{bmatrix} e \\ f \\ g \end{bmatrix} \quad \cdots \quad (III)$$

wherein a represents a mountain peak value near 1130 cm^{-1}, b represents a valley peak value near 967 cm^{-1}, c represents a valley peak value near 911 cm^{-1} and d represents a valley peak value near 736 cm^{-1} in the FT-IR spectrum.

2. (original): A butadiene-based polymer according to claim 1, wherein the cis-1,4 bond content and the vinyl bond content satisfy a relationship of the following equation (I):

(vinyl bond content)≤0.25x((cis-1,4 bond content)-97) (%) ····· (I)

3. (original): A butadiene-based polymer according to claim 1, wherein the ratio (Mw/Mn) of weight average molecular weight (Mw) to number average molecular weight (Mn) is 1.6-2.7.

4. (original): A butadiene-based polymer according to claim 1, wherein the polymer consists of 80-100% by mass of 1,3-butadiene monomer unit and 20-0% by mass of the other monomer unit capable of copolymerizing with 1,3-butadiene.

5. (original): A butadiene-based polymer according to claim 4, wherein the polymer is made of only 1,3-butadiene monomer unit.

6. (original): A butadiene-based polymer according to claim 1, wherein the number average molecular weight (Mn) is 100,000-500,000.

7. (original): A butadiene-based polymer according to claim 6, wherein the number average molecular weight (Mn) is 150,000-300,000.

8. (currently amended): A method of producing a butadiene-based polymer, characterized in that monomers at least containing 1,3-butadiene <u>are</u>~~is~~ polymerized <u>through a</u>

polymerization method except a vapor-phase polymerization at a temperature of not higher than 25°C in the presence of a catalyst system, comprising:

(A) component: a compound containing a rare earth element of Atomic Number 57-71 in the Periodic Table or a reaction product of such a compound with a Lewis base;

(B) component: an organoaluminum compound represented by the following general formula (II):

$$AlR^1R^2R^3 \cdots\cdots (II)$$

(wherein R^1 and R^2 are the same or different and are hydrocarbon group having a carbon number of 1-10 or a hydrogen atom, and R^3 is a hydrocarbon group having a carbon number of 1-10 provided that R^3 may be the same as or different from R^1 or R^2); and

(C) component: at least one of Lewis acid, a complex compound of a metal halogen compound and Lewis base and an organic compound containing an active halogen, and

the catalyst system is previously prepared in the presence of component (A), component (B), component (C), and a conjugated diene monomer.

9-10. (canceled).

11. (original): A method of producing a butadiene-based polymer according to claim 8, wherein the catalyst system further contains (D) component: an aluminoxane.

12. (canceled).

13. (previously presented): A rubber composition, characterized in that a rubber component contains not less than 10% by mass of a butadiene-based polymer as claimed in claim 1.

14. (original): A rubber composition according to claim 13, wherein less than 10 parts by mass of a filler is compounded based on 100 parts by mass of the rubber component.

15. (original): A rubber composition according to claim 14, wherein the rubber composition is sulfur crosslinkable.

16. (previously presented): A tire, characterized in that a rubber composition as claimed in claim 13 is used in any member of the tire.

17. (new): A method of producing a butadiene-based polymer according to claim 11, wherein the rare earth element containing compound in the component (A) is a salt of neodymium soluble in a hydrocarbon solvent.

18. (new): A method of producing a butadiene-based polymer according to claim 17, wherein the rare earth element containing compound in the component (A) is a branched carboxylate of neodymium or a reaction product of such a salt with a Lewis base.